

**WHAT IS CLAIMED IS:**

- 1           1.       A temperature sensing device comprising:  
2                   a first temperature sensor configured for mounting to a structure at a  
3 first distance relative to the structure;  
4                   a second temperature sensor configured for mounting to the structure at  
5 a second distance relative to the structure; and  
6                   a processor coupled to the first and second temperature sensors and  
7 configured to estimate a third temperature based on the first and second temperatures  
8 and the distance separating the first and second temperature sensors.
- 1           2.       The temperature sensing device of claim 1, wherein the first and  
2 second temperature sensors are mounted in a housing.
- 1           3.       The temperature sensing device of claim 1, wherein the second  
2 distance is greater than the first distance.
- 1           4.       The temperature sensing device of claim 1, wherein the third  
2 temperature is an estimate of a temperature at a third distance from the structure, the  
3 third distance being greater than the first and second distances.
- 1           5.       A method of sensing temperatures in a room, comprising:  
2                   mounting a first temperature sensor to a structure in the room at a first  
3 distance relative to the structure;  
4                   mounting a second temperature sensor to the structure at a second  
5 distance relative to the structure;  
6                   measuring a first temperature with the first temperature sensor;  
7                   measuring a second temperature with the second temperature sensor;  
8 and  
9                   estimating a third temperature from the first and second temperatures.

1           6.       The method of claim 5, further including coupling a processor to the  
2 first and second temperature sensors, and wherein the third temperature is calculated  
3 by the processor.

1           7.       The method of claim 5, wherein the first and second temperature  
2 sensors are mounted in a housing.

1           8.       The method of claim 5, wherein the processor is mounted in the  
2 housing.

1           9.       The method of claim 5, wherein the second distance is greater than the  
2 first distance.

1           10.      The method of claim 5, wherein the third temperature is an estimate of  
2 a temperature at a third distance from the structure, the third distance being greater  
3 than the first and second distances.

1           11.      A temperature sensing device, comprising:  
2                   a housing;  
3                   a first temperature sensor mounted within the housing and configured  
4 to sense a first temperature;  
5                   a second temperature sensor mounted within the housing and spaced  
6 apart from the first temperature sensor, and configured to sense a second temperature;  
7 and  
8                   a processor coupled to the first temperature sensor and the second  
9 temperature sensor and configured to estimate a third temperature using the first  
10 temperature and the second temperature.

1           12.      The temperature sensing device of claim 11; wherein the first  
2 temperature sensor is positioned proximate to a first surface of the housing and the  
3 second temperature sensor is positioned proximate to a second surface of the housing  
4 spaced apart from the first surface.

1           13.     The temperature sensing device of claim 12, wherein the housing is  
2     configured to be mounted to a structure of a building such that the first surface is  
3     adjacent to a surface of the structure of the building.

1           14.     The temperature sensing device of claim 13, wherein the first  
2     temperature is the temperature at or near the surface of the structure of the building.

1           15.     The temperature sensing device of claim 14, wherein the structure of  
2     the building is a wall.

1           16.     The temperature sensing device of claim 15, wherein the third  
2     temperature is an air temperature of a room including the wall.

1           17.     The temperature sensing device of claim 11, wherein the third  
2     temperature is estimated from the first temperature and the second temperature using  
3     an extrapolation function.

1           18.     The temperature sensing device of claim 17, wherein the extrapolation  
2     function is a linear extrapolation function.

1           19.     The temperature sensing device of claim 17, wherein the extrapolation  
2     function is a non-linear extrapolation function.

1           20.     The temperature sensing device of claim 17, wherein the extrapolation  
2     function includes a correction factor.

1           21.     The temperature sensing device of claim 20, wherein the correction  
2     factor is based on estimated environmental or structural conditions of a building.

1           22.     The temperature sensing device of claim 11, wherein the temperature  
2     sensing device is a thermostat configured to be used with a climate control system.

1           23.     The temperature sensing device of claim 22, wherein the climate  
2     control system is a heating, ventilating, and air conditioning system.

1           24.    The temperature sensing device of claim 11, wherein the processor is  
2   mounted within the housing.

1           25.    A method comprising:  
2                    measuring a first temperature using a first temperature sensor mounted  
3   within a housing;  
4                    measuring a second temperature using a second temperature sensor  
5   mounted within the housing and spaced apart from the first temperature sensor; and  
6                    estimating a third temperature from the first temperature and the  
7   second temperature using a processor coupled to the first temperature sensor and the  
8   second temperature sensor.

1           26.    The method of claim 25, wherein the third temperature is estimated  
2   from the first temperature and the second temperature using an extrapolation function.

1           27.    The method of claim 26, wherein the extrapolation function is a linear  
2   extrapolation function.

1           28.    The method of claim 26, wherein the extrapolation function is a non-  
2   linear extrapolation function.

1           29.    The method of claim 26, wherein the extrapolation function includes a  
2   correction factor.

1           30.    The method of claim 29, wherein the correction factor is based on  
2   estimated environmental or structural conditions of a building.

1           31.    The method of claim 30, wherein the first temperature sensor is  
2   positioned proximate to a first surface of the housing and the second temperature  
3   sensor is positioned proximate to a second surface of the housing.

1           32.    The method of claim 31, wherein the housing is configured to be  
2   mounted to a structure of a building such that the first surface is exposed to a surface  
3   of the structure of the building.

1           33.     The method of claim 32, wherein the first temperature is the  
2     temperature at or near the surface of the structure of the building.

1           34.     The method of claim 33, wherein the structure of the building is a wall.

1           35.     The method of claim 34, wherein the third temperature is an air  
2     temperature of a room including the wall.

1           36.     A temperature sensing device, comprising:  
2                   a housing;  
3                   a first temperature sensing means mounted within the housing and  
4     configured to sense a first temperature;  
5                   a second temperature sensing means mounted within the housing and  
6     spaced apart from the first temperature sensing means, and configured to sense a  
7     second temperature; and  
8                   means coupled to the first temperature sensor and the second  
9     temperature sensor for estimating a third temperature from the first temperature and  
10    the second temperature.

1           37.     The temperature sensing device of claim 36, the first temperature  
2     sensor is positioned proximate to a first surface of the housing and the second  
3     temperature sensor is positioned proximate to a second surface of the housing.

1           38.     The temperature sensing device of claim 37, wherein the housing is  
2     configured to be mounted to a structure of a building such that the first surface is  
3     adjacent to a surface of the structure of the building.

1           39.     The temperature sensing device of claim 38, wherein the first  
2     temperature is the temperature of the surface of the structure of the building.

1           40.     The temperature sensing device of claim 39, wherein the structure of  
2     the building is a wall.

1           41.     The temperature sensing device of claim 36, wherein the third  
2     temperature is an air temperature of a room including the wall.

1           42.     The temperature sensing device of claim 36, wherein the temperature  
2     sensing device is a thermostat configured to be used with a climate control system.

1           43.     The temperature sensing device of claim 43, wherein the climate  
2     control system is a heating, ventilating, and air conditioning system.

1           44.     A temperature sensing device comprising:  
2                   a first temperature sensor configured to sense a first temperature;  
3                   a second temperature sensor spaced apart from the first temperature  
4     sensor, and configured to sense a second temperature; and  
5                   a processor coupled to the first temperature sensor and the second  
6     temperature sensor and configured to:  
7                   estimate a heat transfer rate associated with at least one of the  
8     first temperature and the second temperature; and  
9                   determine an air temperature set point based on the heat  
10    transfer rate.